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CLAIMS:

1. A trim press article handling apparatus, comprising:
2. a frame;
3. a punch carried by the frame;
4. a die carried by the frame and cooperating in relative
5. movement with the punch to sever articles from a web; and
6. a treadle carried for movement relative to the die, the
7. treadle including a web guide member, a primary guide strip spaced from
8. the guide member slightly greater than a thickness of the web, a
9. secondary guide strip spaced from the guide member at least four
10. thicknesses of the web and spaced apart from the primary guide strip,
11. and an article detector carried by at least one of the primary guide strip
12. and the secondary guide strip and operative to detect position of an
13. article in the web by detecting the position of a protuberance in the
14. web as the protuberance is conveyed between the primary guide strip and
15. the secondary guide strip.
16.

17.
18. 2. The article handling apparatus of claim 1 further comprising
19. control circuitry communicating with the article detector and a drive
20. motor operative to move the treadle, the control circuitry configured to
21. receive an input signal from the article detector indicative of the position
22. of a web-supported article relative to the punch and the die, and
23. operative to control operation of the drive motor to synchronize

1 movement of the web-supported article via controlled motion of the
2 treadle.

3. The article handling apparatus of claim 2 wherein the article
4 detector comprises an optical emitter and a photodetector, one of the
5 optical emitter and the photodetector provided on the primary guide strip
6 and the other provided on the secondary guide strip spaced apart from
7 the primary guide strip, wherein movement of a protuberance in the web
8 between the optical emitter and the photodetector generates an output
9 signal from the photodetector to the control circuitry indicative of the
10 location of an article relative to the guide plate member.

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13 4. The article handling apparatus of claim 2 wherein the article
14 detector comprises an optical detector configured to generate a signal
15 indicative of a change of state when a protuberance is detected with the
16 optical detector.

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18 5. The article handling apparatus of claim 2 wherein the
19 protuberance is an article formed in web.

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21 6. The article handling apparatus of claim 2 further comprising
22 a drive wheel assembly for moving a web and articles, the drive wheel

1 assembly comprising a pair of roller feed assemblies provided on opposed
2 edges of a web.

3
4 7. The article handling apparatus of claim 6 wherein each of
5 the pair of roller feed assemblies provides a servo pick assembly having
6 a servo motor controllably driven by the control circuitry.

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8 8. The article handling apparatus of claim 1 wherein the
9 primary guide strip and the web guide member depend in a vertical
10 orientation from the treadle and the punch and the die are supported
11 for relative movement in a horizontal direction.

12
13 9. The article handling apparatus of claim 7 wherein a topmost
14 portion of the primary guide strip is flared away from the web guide
15 member to accommodate entrance feeding of the web during movement
16 between the treadle and the frame.

17
18 10. The article handling apparatus of claim 1 wherein the web
19 guide member comprises a web guide plate providing a stripper plate for
20 a trim press.

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22 11. An article conveying, guiding, and locating device, comprising:
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1 a treadle including a web guide plate, a guide strip spaced
2 slightly greater than a thickness of the web from the guide plate;

3 a web conveyor having a servo pick assembly and a servo
4 helper assembly driven by a servo motor, and configured to move a web
5 of articles wherein the servo pick assembly is carried by the treadle;

6 an article detector carried by the treadle and operative to
7 detect location of an article in the web during movement of the web;
8 and

9 a controller communicating with the drive motors and the
10 article detector and operative to controllably regulate and synchronize
11 operation of the servo pick assembly and the servo helper assembly in
12 response to detected location of the article.

13
14 12. The device of claim 11 wherein the motor for the servo pick
15 assembly comprises a servo motor carried by the treadle.

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17 13. The device of claim 11 wherein the article detector detects
18 location of an article in the web by optically detecting the location of
19 a protuberance in the web provided at a known location in the web
20 relative to an article.

21
22 14. The device of claim 11 wherein the web conveyor comprises
23 a pair of wheels provided along each edge of the web.

1 15. The device of claim 14 wherein each pair of the wheels
2 comprises a drive wheel and a follower wheel coating on opposite sides
3 of the web, wherein the drive wheel is driven by a servo motor under
4 control of the controller.

5
6 16. The device of claim 11 wherein one of the drive wheel and
7 the follower wheel is selectively engaged and disengaged under control
8 of the controller such that each pair of drive wheel and follower wheel
9 is disengaged in anticipation of a severing operation to remove the
10 articles from the web.

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12 17. The device of claim 11 wherein the guide strip is spaced
13 from the guide plate less than four thicknesses of the web.

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15 18. The device of claim 11 further comprising a canopy, wherein
16 the servo helper assembly is carried by the canopy and the servo pick
17 assembly is carried by the treadle, and wherein a web detector is
18 provided between the servo helper assembly and the servo pick assembly
19 to detect proximity of the web relative to the canopy, and wherein the
20 controller, in response to movement of web from the canopy, regulates
21 operating speed of the motor for the servo helper assembly to adjust
22 delivery speed at the servo helper assembly relative to delivery speed of
23 the motor at the servo pick assembly.

19. A method for delivering web-supported articles between dies and punches of a trim press, comprising:

providing a treadle having an article detector; while moving the web and articles, guiding the web and articles along the web and between a pair of articles in a row extending transverse to a travel path direction;

detecting location of an article in the web using the article detector; and

in response to detecting the location of the article, controllably moving the web to position the article between a corresponding punch and die of the trim press.

20. The method of claim 19 wherein the step of detecting location comprises optically detecting movement of an article relative to the article detector.

21. The method of claim 19 wherein the step of detecting location of an article comprises optically detecting a protuberance in the web.

22. The method of claim 19 wherein the protuberance is an article embedded in a web.